

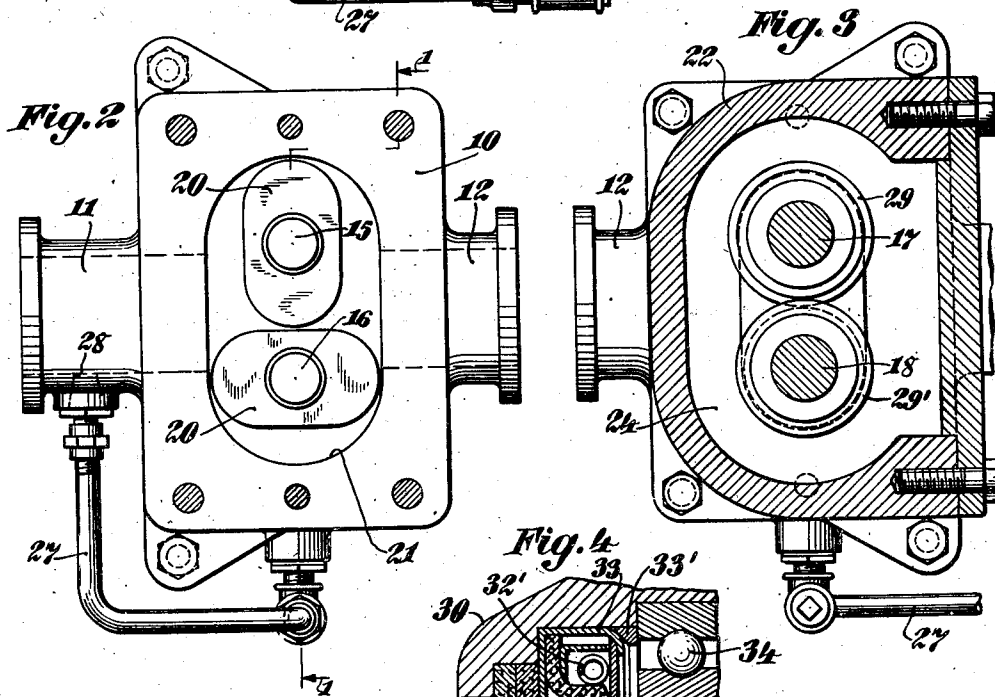
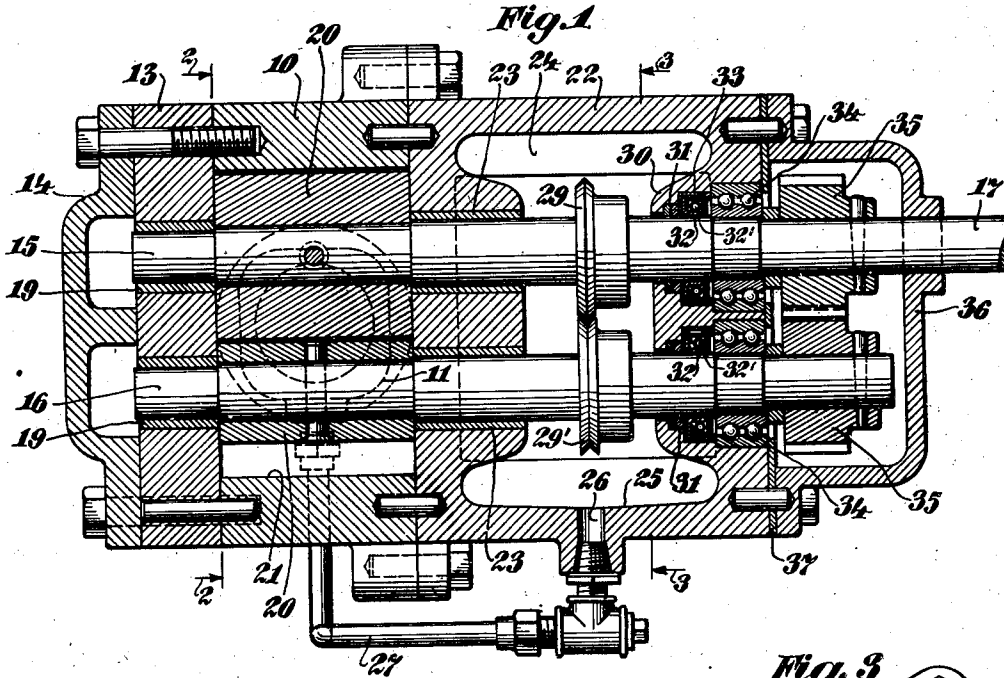
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PUMP FOR INK CIRCULATING SYSTEMS

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PUMP FOR INK CIRCULATING SYSTEMS

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1 Claim. (Cl. 103—126)

The present invention relates to ink pumps for ink circulating systems for use with rotary intaglio printing presses such as shown and described in the U. S. patent to Weiss No. 2,014,303, granted September 10, 1935.

In ink circulating systems of the type shown in the above Weiss patent, considerable difficulty is experienced in maintaining an effective seal about the rotating elements of the pump to avoid loss of ink from the ink circulating system and the consequent injurious effect of the ink which leaks from such systems and comes into contact with adjacent mechanism including the bearings, pump driving mechanism, etc.

The present invention provides a mechanism by means of which leakage of ink from the ink circulating system is avoided, thus relieving the mechanism from the deleterious effects of ink leakage, as above noted.

A further object of the invention is to provide an ink pump of the above character wherein friction ink seals are dispensed with, thus greatly decreasing the amount of power required to drive the pump.

A further object of the invention is to provide a pump mechanism of the above character wherein the structure affords long bearings on the pump shafts where the greatest strain occurs.

A further object of the invention is to provide a pump mechanism of the above character wherein the structure is such as to prevent leakage of air into the ink system.

Further objects and advantages of the invention will be apparent as it is described in greater detail in connection with the accompanying drawing, wherein:

Figure 1 is a view in vertical section, taken on a plane passing through the pump mechanism, constructed in accordance with the present invention. The section upon which Figure 1 is taken is illustrated by the line 1—1 in Figure 2.

Figure 2 is a view in transverse section, taken on line 2—2 of Figure 1 and looking in the direction of the arrows.

Figure 3 is a view in section, taken on the line 3—3 of Figure 1 and looking in the direction of the arrows.

Figure 4 is an enlarged sectional view of a packing member partly broken away for a pump drive shaft.

Referring to the above drawing, a pump housing is shown at 10 and is provided with an ink intake pipe 11 and a discharge pipe 12. These pipes may be flanged in order to facilitate connecting them in the ink circulating systems now

in common use, as shown diagrammatically in the Weiss patent above referred to. Secured to the end face of a housing 10 is a bearing plate 13 upon which a cover plate 14 is secured. Bearing plate 13 receives the ends 15 and 16 of pump shafts 17 and 18, respectively. Suitable bushings 19 may be carried by the bearing plate 13 in order that the shaft ends may be properly journaled.

The shafts 17 and 18 are provided with pump rotors 20 as shown in Figure 2, these rotors being received within the pump chamber 21, formed within pump housing 10. The foregoing structure follows standard practice in pump design and constitutes no part of the present invention.

In order that leakage of ink may be avoided from the ink circulating system within which pipes 11 and 12 are received, a seal is provided about the pump shafts 17 and 18, this seal comprising a housing 22 provided with relatively long bearings 23 for journaling the shafts 17 and 18. Inasmuch as these bearings receive the greatest relative stress of the shaft bearings included in the mechanism, they are made relatively long, as shown in Figure 1. Within the housing 22 a chamber 24 is formed, the chamber being provided with a sump 25 in the lower portion thereof. A passage 26 communicates with the sump 25 and an ink return pipe 27 which communicates with a passage 28 formed in the intake pipe 11.

Upon shafts 17 and 18, discs 29 and 29' are provided respectively. Disc 29 is preferably formed with a peripheral ridge which is received within a similarly formed peripheral groove in the disc 29'. Each of the discs is non-rotatably secured to the respective shafts in order that they may rotate during operation of the pump. Ink which leaks through the bearings 23 advances along the shafts 17 and 18 until it reaches the discs 29 and 29'. Inasmuch as the discs are rotating during operation of the pump and when ink leakage occurs, the ink is drawn outwardly by centrifugal force and flows to the bottom of the chamber 24 and into the sump 25. Inasmuch as the pipe line 27 communicates with the intake pipe 11, a suction exists in the pipe 27, causing the ink which has leaked from the bearings 23 to be returned to the intake side of the pump.

To prevent leakage of air into the chamber 24, the pump housing 22 is formed with an internal boss 30 through which the shafts 17 and 18 extend. Mounted in the boss 30 are oil seal-

ing rings of known type consisting of a leather washer 31 and annular packing members 32 having angularly related portions lying concentrically against the shafts 17 and 18. The packing members 32 are retained in liquid tight relationship to the shafts 17 and 18 by a tension spring 32'. The packing member 32 and spring 32' are mounted in a suitable housing 33 which is held in position by a tapered ring 33' which contacts the roller bearings 34.

The drive between shafts 17 and 18 is provided by means of interengaging pinions 35, carried by the respective shafts and a suitable cover 36 is provided upon the end of housing 22. A locating plate 37 is provided to maintain the bearings 34 in the assembled positions shown.

In operation, any ink leaking through bearings 23 will run down the walls of chamber 24 to the sump 25 and/or will flow along the shafts 17 and 18 to the disks 29, 29'. As the disks rotate the ink will be thrown centrifugally into the chamber 24 where it will accumulate, be drawn off through pipe 27 to the intake pipe 11 and returned to the pump due to the suction created by the pump.

Reduced pressure is maintained in the chamber and air leakage into the chamber 24 is prevented by the bearing packings 32. Thus air cannot become mixed with the ink and the formation of an ink froth is avoided.

It will be understood that construction embodying the invention prevents ink leakage and loss without necessitating a great increase in power for actuating the pump. Also, the roller

bearings and gears are protected from the ink and can be lubricated properly, thereby greatly increasing their useful life.

It should also be understood that the many variations can be made in the disclosed embodiment of the invention without deviating from the inventive concept. Therefore, the disclosed embodiment should be considered as illustrative, only, and not as limiting the scope of the invention as defined in the following claim.

I claim:

In an ink pump for printing press ink circulating systems, a housing having intake and discharge connections, means in said housing for circulating ink from said intake connection through said discharge connection, a low pressure sump chamber attached to said housing, a conduit connecting said sump chamber to said intake connection, a pair of spaced bearings between the housing and chamber, a second pair of bearings in an outer wall of said chamber aligned with the first bearings, a pair of drive shafts journaled in said bearings for actuating said ink circulating means, means hermetically sealing said shafts in the outer wall of said chamber, said sealing means being positioned on the inner side of the bearings in the outer wall of the said sump chamber to protect the said bearings from the ink and the ink vapors within the sump chamber, and disk members carried by said shafts within the sump chamber and having interengaging peripheries for diverting ink leaking along said shafts into said chamber.

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